REMARKS

Claim Rejections - 35 USC § 112

Claims 4, 5, 7, 11, 16, 17, 26 and 27 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims have been amended to remedy the stated basis of rejection. No new matter is added by the claim amendments.

The following text passage has been added to dependent claims 4 and 16:

"*the second value of the liquid surface level being later in the predetermined direction than the first value of the liquid surface level*".

This is supported by figure 3 and the text passage of the description explaining figure 3. Furthermore, a skilled person who is familiar with the present application sees directly that it would be contrary to the idea of the present invention for minimizing energy consumption if the "second value of the liquid surface level" were earlier in the predetermined direction than "the first value of the liquid surface level", because the pump is rotated at the speed at which amount of transferred liquid relative to consumed energy is at maximum when the liquid surface level reaches said first value of the liquid surface level from the

predetermined direction. This gives an implicit support for the above-mentioned clarification by addition to claims 4 and 16.

The following text passage has been added to dependent claim 7:

"the third value of the liquid surface level being later in the predetermined direction than the first value of the liquid surface level".

A skilled person who is familiar with the present application sees directly that it would be contrary to the idea of the present invention for minimizing energy consumption if the "third value of the liquid surface level" were earlier in the predetermined direction than the "first value of the liquid surface level", because the pump is rotated at the speed at which amount of transferred liquid relative to consumed energy is at maximum when the liquid surface level reaches said first value of the liquid surface level from the predetermined direction. This gives an implicit support for the above-mentioned clarification by addition to claim 7.

The following underlined subject matter has been added to dependent claims 11, 26, and 27:

"the selected alarm limit value is later in the predetermined direction than the first value of the liquid surface level".

A skilled person who is familiar with the present application sees directly that it would be contrary to the idea of the present invention for minimizing energy consumption if the "alarm limit value" were earlier in the predetermined direction than the "first value of the liquid surface level", because the pump is rotated at the speed at which amount of transferred liquid relative to consumed energy is at maximum when the liquid surface level reaches said first value of the liquid surface level from the predetermined direction. This gives an implicit support for the above-mentioned clarification by addition to claims 11, 26, and 27.

The independent claims of the present application recite, inter alia (emphasis added):

"*detecting a second moment when the liquid surface level reaches, from the direction opposite to the predetermined direction, another value of the liquid surface level that is later in the direction **opposite** to the predetermined direction than the first value of the liquid surface level*".

Amended dependent claims recite (emphasis added):

"*the second value of the liquid surface level being later in the predetermined direction than the first value of the liquid surface level*",

"*the third value of the liquid surface level being later in the predetermined direction than the first value of the liquid surface level*", and

"*the selected alarm limit value is later in the predetermined direction than the first value of the liquid surface level*".

Hence, the "another value of the liquid surface level" mentioned in the independent claims is on one side (below or above) with respect to the first value of the liquid surface level and the "*second value of the liquid surface level*", "*third value of the liquid surface level*", and "*alarm limit value*" mentioned in the dependent claim are on the other side (above or below) with respect to the first value of the liquid surface level. Therefore, in our view, the relationship of the "*another value of the liquid surface level*" mentioned in the independent claims to the liquid surface level values mentioned in the dependent claims is clear.

Withdrawal of this rejection is solicited.

Claim Rejections - 35 USC § 103

Claims 1, 3-5, 7-13, 16-17, and 20-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Struthers (US Patent 6,481,973) in view of Rishel (US Patent 4,945,491).

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Struthers in view of Rishel as applied to claims 1, and further in view of Dryden (US Patent 2,462,076).

Traverse

The independent claims have been amended. No new matter is added by the claim amendments.

The word "*predetermined*" has been added to the independent claims:

"*…selecting as a first value of pump rotation speed substantially a predetermined value at which an amount of transferred liquid relative to consumed energy is at maximum…*".

This amendment by addition is supported by e.g. the following text passage on page 3 of the original description of the present application (emphasis added):

"*The objectives of the invention are attained with a solution, in which the liquid surface level is measured, and when a given surface level value has been passed by, the electric drive of the pump is controlled to a predetermined rotation speed. This predetermined value of the rotation speed is preferably the rotation speed at which the rate of flow relative to the consumed power, i.e. the efficiency, is at maximum.*"

Withdrawal of the obviousness rejections is solicited for the below reasons.

The method defined in the amended independent claims makes possible to have a pumping system in which the liquid surface can be kept between two pre-determined limit values and the pumps can be used so that each pump is either de-energized,

i.e. no losses, or run at a speed at which amount of transferred liquid relative to consumed energy is at maximum. Hence, the liquid surface can be kept between the two limit values with minimal energy consumption **without a need to determine the wire-to-water efficiency on-line** because the speed at which amount of transferred liquid relative to consumed energy is at maximum is determined off-line as indicated by the word "*predetermined*" in the independent claims.

In the "*Response to Arguments*" -section of the Office Action, the Examiner refers to claim 12 and says that claim 12 would indicate that the rotation speed is deliberately varied. This seems to be an unintentional mistake or a misunderstanding because claim 12 recites the varying of the first value of the liquid surface level but claim 12 is silent about varying of the first value of pump rotation speed.

In the system disclosed by Rishel (US4945491), the wire-to-water efficiency is determined on-line during operation. Actually, Rishel teaches a method to monitor and determine the efficiency on-line in order to be able to control the system, see e.g. the abstract of Rishel.

Struthers (US6481973) does not even handle the problem of optimizing the efficiency of a pumping system. Instead, Struthers deals with achieving a desired pumping rate and recovering from clogging situations.

If a skilled person applied the teaching of Rishel to the system of Struthers, the skilled person would arrive at a technical solution where:

1) the system of Struthers is provided with the on-line detection of the wire-to-water efficiency described by Rishel, and

2) the use of the "*standard speed*" mentioned by Struthers is replaced by the use of speed that is varied in accordance with the said on-line detection of the wire-to-water efficiency.

This strongly deviates from the principle manifested by the amended independent claims, where the optimization of the efficiency is based on the usage of a predetermined rotation speed value at which amount of transferred liquid relative to consumed energy is at maximum.

The cited prior art disclose nothing that would lead a skilled person to further modify the system of Struthers modified in view of Rishel so that the principle of the on-line detection of the wire-to-water efficiency would be abandoned and, instead, a predetermined rotation speed value would be used.

Therefore, the cited prior art disclose nothing that would lead a skilled person to modify the technical solution disclosed by Struthers so that the skilled person would arrive at the technical solution defined in the amended independent claims. Hence, the amended independent claims are non-obvious

over the cited prior art. The dependent claims are also non-obvious at least by virtue of the references to the amended independent claims.

Reconsideration and allowance of the claims are respectfully requested.

Summary

This response is believed to be fully responsive and to put the case in condition for allowance. Entry of the amendment, and an early and favorable action on the merits, are earnestly requested. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Should there be any matters that need to be resolved in the present application; the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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